BSC 307 5-E Model Lesson Plan

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| **Title: The Mystery from Planet Xenon** | **Grade Level:**  **9** |
| **Objectives:**  **TSWBAT** list definitions of diffusion and osmosis.  **TSWBAT** measure water and powders using science lab utensils.  **TSWBAT** explain how a selectively permeable membrane works by allowing small iodine molecules through to react with the corn starch to produce a blue/black color. | |
| **Illinois Learning Standards:**  **Stage I: 12 A: 1** Apply scientific inquiries or technological designs to analyze the cellular organelles and functions, using different microscopic techniques, explaining functional processes chemically and structurally (e.g., osmotic, active and facilitated transport, enzyme action and protein/lipid/carbohydrate metabolism). | |
| **Engagement:** Students will be asked to solve a mystery about a white powder found on plant Xenon. I will discuss the pre-lab questions with the class that include talking about diffusion, osmosis, selectively permeable membrane, and molecules move from high to low concentration. Then, I will ask the students if they know what a dialysis bag is used for. We will talk about the process of dialysis, where it is used, and what is used for. | |
| **Exploration**: Students will fill two dialysis bags, one with a solution of the mystery powder and water, and the other with a solution of a known powder and water. The mystery powder is cornstarch and the known powders include baking powder, baking soda, powdered sugar, and baby powder. Students will place these bags into beakers filled with water and 20 drops of iodine and wait 15 minutes. Finally, students will observe the color change with the mystery powder and no change with their known powder. | |
| **Explanation:** Students will observe the color change in the dialysis bag from white to a dark blue/black which shows the iodine molecules have moved though the selectively permeable membrane and reacted with the cornstarch. Students will be able to observe diffusion of molecules taking place in this experiment. | |
| **Elaboration:** The post-lab questions will talk about which substances moved, and students will learn why iodine is considered an indicator. Students will be able to use their newly learned knowledge to draw their experiment with arrows showing the flow of molecules and be able to explain what would happen if the experiment was modified to have the iodine solution in the bag and the powder solution in the beaker. | |
| **Evaluation(Assessment Strategies):** Students will be given points for actually completing the lab and the lab packets will be turned in for points. Students will be assessed on completing the questions correctly, their ability to follow directions, complete the lab correctly, take accurate measurements, and describing their observations. | |
| **Rationale:** This purpose of this lab is to teach the students about diffusion and osmosis by using dialysis bags and cornstarch. Students will be given a mystery that they must solve to figure out what the mystery powder is. Students will use critical thinking skills while seeing the powder and water mixture in the dialysis bags change to a dark blue/black color. | |
| **Resources:** The lesson plan I found and modified is found at:  <http://www.biologycorner.com/worksheets/diffusionlab.html> | |